



EA090A Series

The EA090A Series Brushless DC Motor is a high torque model brushless motor designed in a NEMA 34 package with an IP-65 rating. It is offered in 4 motor lengths with continuous torque from 1.8 – 4.6 Nm.

EA Automation Grade Motors

For applications that require feedback connectivity to other machinery components. IP-65 Rated

■ Benefits

- Speeds up to 6,000 RPM possible
- DC bus voltage up to 325 VDC
- NEMA 34 package
- Five standard windings
- 4 pole rare earth design

■ Optional Assemblies

- Encoders: Q, C Types
- Programmable Drive: BGE6060A

■ Motor Characteristics

Motor Data	Units	Part No.			
		EA090A-1	EA090A-2	EA090A-3	
Max DC Terminal Voltage	V_T	325			
Max Speed (Mechanical)	ω_{MAX}	6000			
Continuous Stall Torque ¹	T_{CS}	Nm	1.8	3.4	4.6
		lb-in	260	480	650
Peak Torque (Maximum) ¹	T_{pk}	Nm	9.5	18	25
		lb-in	1300	2500	3500
Coulomb Friction Torque	T_f	Nm	0.041	0.055	0.069
		oz-in	5.8	7.8	9.8
Viscous Damping Factor	D	Nm/(rad/s)	2.7E-05	6.7E-05	2.0E-04
		oz-in/krpm	0.40	1.0	2.9
Thermal Time Constant	τ_{th}	min	20	25	30
Thermal Resistance	R_{th}	°C/W	1.1	0.89	0.78
Max. Winding Temperature	Θ_{MAX}	°C	155	155	155
Rotor Inertia	J_r	kg-m ²	1.1E-04	2.0E-04	2.9E-04
		lb-in-s ²	0.016	0.029	0.042
Motor Weight	W_m	g	3600	5000	6500
		oz	130	180	230

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink. **For PBL4850E to operate a brush motor, an encoder is required.

Dimensional Drawings: EA090A-1 • EA090A-2 • EA090A-3

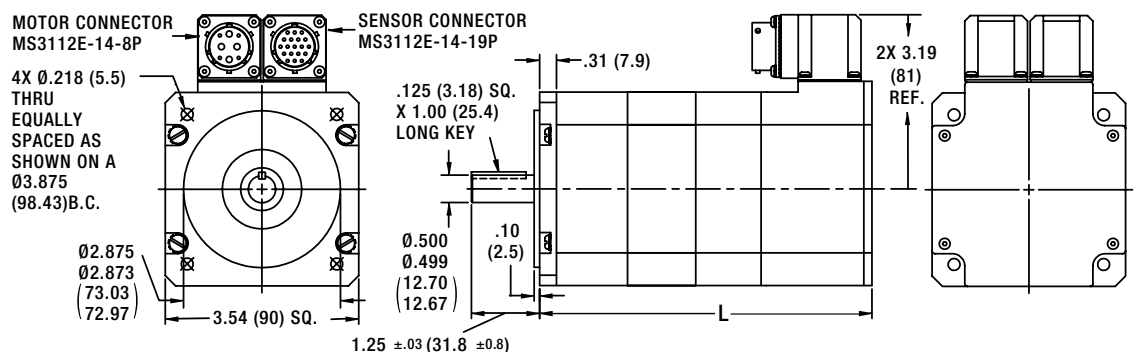
Dimensions = inches (mm)

L = Lengths Available

EA090A-1 = 6.09±.06 (154.7) ±1.5

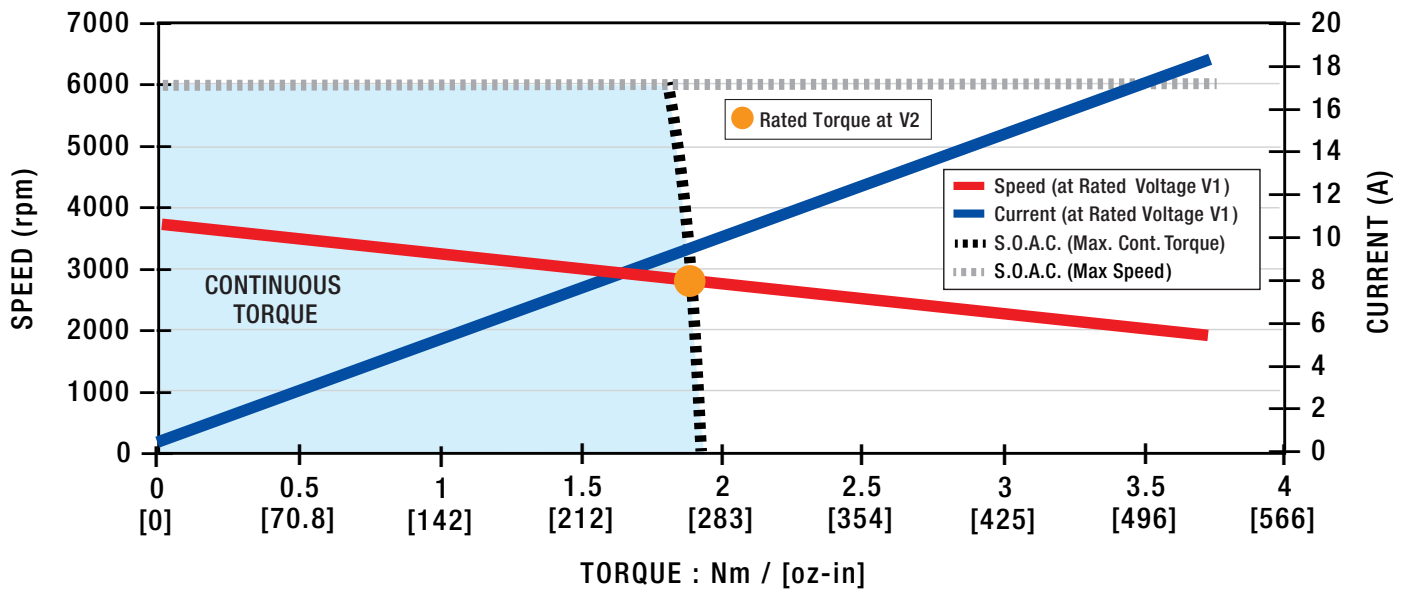
EA090A-2 = 7.34±.06 (186.4) ±1.5

EA090A-3 = 8.59±.06 (218.2) ±1.5



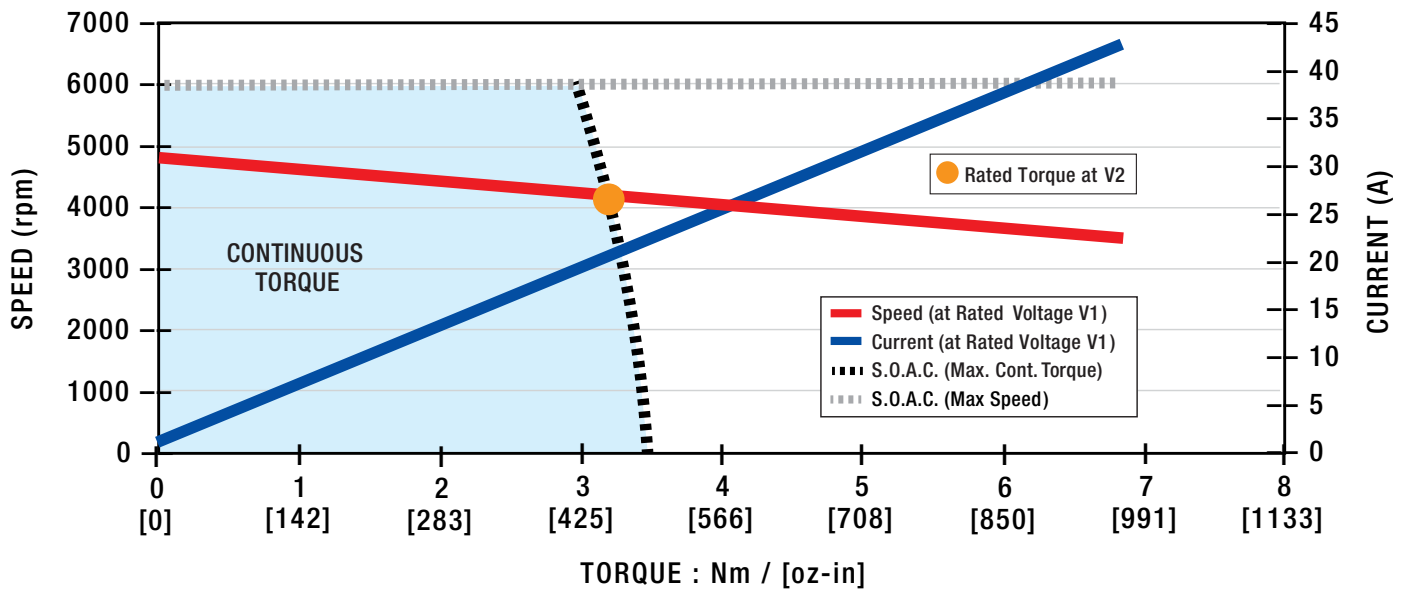
Motor Data		Units					
Rated Voltage V1	V_r	V	152	305	152	305	305
Rated Torque ¹ •	T_r	Nm	1.7	1.5	1.7	1.7	1.7
		oz-in	240	220	240	240	250
Rated Speed ¹	ω_r	rpm	6000	6000	6000	6000	5160
Rated Current ¹	I_r	A	11	8.7	8.7	6.2	3.7
Rated Power ¹	P_r	W	1000	960	1100	1100	940
No Load Speed	ω_{nl}	rpm	6000	6000	6000	6000	5840
No Load Current	I_{nl}	A	0.35	0.31	0.28	0.20	0.12
Rated Voltage V2	V_r	V	76.0	170	76.0	152	152
Rated Torque ¹ •	T_r	Nm	1.8	1.6	1.9	1.8	1.9
		oz-in	250	220	270	260	260
Rated Speed ¹	ω_r	rpm	3650	6000	2760	4290	2150
Rated Current ¹	I_r	A	11	8.7	9.5	6.5	3.9
Rated Power ¹	P_r	W	690	980	540	810	420
No Load Speed	ω_{nl}	rpm	4370	6000	3490	4990	2910
No Load Current	I_{nl}	A	0.33	0.31	0.25	0.19	0.099
Motor Constant	K_M	Nm/ \sqrt{W}	0.19	0.18	0.19	0.19	0.19
		oz-in/ \sqrt{W}	27	26	27	27	27
Torque Constant	K_T	Nm/A	0.165	0.191	0.207	0.289	0.497
		oz-in/A	23.4	27.0	29.3	41.0	70.3
Voltage Constant	K_E	V/(rad/s)	0.165	0.191	0.207	0.289	0.497
		V/krpm	17.3	20.0	21.7	30.3	52.0
Terminal Resistance	R_{mt}	Ω	0.760	1.12	1.14	2.26	6.77
Inductance	L	mH	1.9	2.6	3.0	5.9	17
Peak Current	I_{pk}	A	60	50	50	35	21
Electrical Time Constant	τ_e	ms	2.5	2.3	2.6	2.6	2.6
Mechanical Time Constant	τ_m	ms	3.1	3.5	3.0	3.1	3.1

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.



Motor Data		Units					
Rated Voltage V1	V_r	V	152	152	305	305	305
Rated Torque ¹ •	T_r	Nm	2.9	3.0	2.7	3.0	3.1
		oz-in	400	420	390	420	440
Rated Speed ¹	ω_r	rpm	6000	6000	6000	5700	5560
Rated Current ¹	I_r	A	19	17	10	6.5	6.5
Rated Power ¹	P_r	W	1800	1900	1700	1800	1800
No Load Speed	ω_{nl}	rpm	6000	6000	6000	6000	5850
No Load Current	I_{nl}	A	0.61	0.51	0.34	0.21	0.20
Rated Voltage V2	V_r	V	76.0	76.0	152	170	152
Rated Torque ¹ •	T_r	Nm	3.2	3.4	3.0	3.4	3.5
		oz-in	450	480	420	480	490
Rated Speed ¹	ω_r	rpm	4120	3320	4690	2930	2500
Rated Current ¹	I_r	A	21	18	11	7.3	7.3
Rated Power ¹	P_r	W	1400	1200	1500	1000	910
No Load Speed	ω_{nl}	rpm	4480	3750	5050	3340	2910
No Load Current	I_{nl}	A	0.54	0.43	0.32	0.17	0.16
Motor Constant	K_M	Nm/ \sqrt{W}	0.33	0.33	0.32	0.33	0.34
		oz-in/ \sqrt{W}	47	46	45	47	48
Torque Constant	K_T	Nm/A	0.161	0.193	0.286	0.484	0.497
		oz-in/A	22.9	27.3	40.6	68.6	70.3
Voltage Constant	K_E	V/(rad/s)	0.161	0.193	0.286	0.484	0.497
		V/krpm	16.9	20.2	30.0	50.7	52.0
Terminal Resistance	R_{mt}	Ω	0.240	0.350	0.820	2.14	2.14
Inductance	L	mH	0.81	1.2	2.6	7.3	7.3
Peak Current	I_{pk}	A	120	100	65	39	39
Electrical Time Constant	τ_e	ms	3.4	3.3	3.2	3.4	3.4
Mechanical Time Constant	τ_m	ms	1.9	1.9	2.0	1.9	1.8

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.



Motor Data		Units					
Rated Voltage V1	V_r	V	305	152	305	305	305
Rated Torque ¹ •	T_r	Nm	2.8	2.9	2.9	3.6	4.1
		oz-in	390	420	420	510	580
Rated Speed ¹	ω_r	rpm	6000	5980	6000	4880	3790
Rated Current ¹	I_r	A	16	13	9.8	6.8	6.1
Rated Power ¹	P_r	W	1700	1800	1800	1900	1600
No Load Speed	ω_{nl}	rpm	6000	5980	6000	5000	4000
No Load Current	I_{nl}	A	1.0	0.80	0.58	0.30	0.21
Rated Voltage V2	V_r	V	152	76.0	152	152	170
Rated Torque ¹ •	T_r	Nm	2.8	4.4	4.0	4.6	4.7
		oz-in	400	620	560	650	660
Rated Speed ¹	ω_r	rpm	6000	2730	4150	2200	1920
Rated Current ¹	I_r	A	16	19	13	8.4	6.8
Rated Power ¹	P_r	W	1800	1300	1700	1100	940
No Load Speed	ω_{nl}	rpm	6000	2990	4330	2490	2230
No Load Current	I_{nl}	A	1.0	0.54	0.48	0.21	0.16
Motor Constant	K_M	Nm/ \sqrt{W}	0.43	0.45	0.45	0.45	0.45
		oz-in/ \sqrt{W}	61	64	64	64	63
Torque Constant	K_T	Nm/A	0.194	0.242	0.334	0.581	0.726
		oz-in/A	27.4	34.3	47.3	82.2	103
Voltage Constant	K_E	V/(rad/s)	0.194	0.242	0.334	0.581	0.726
		V/krpm	20.3	25.3	35.0	60.8	76.0
Terminal Resistance	R_{mt}	Ω	0.200	0.290	0.550	1.66	2.64
Inductance	L	mH	0.71	1.1	2.2	6.4	10
Peak Current	I_{pk}	A	130	110	80	45	36
Electrical Time Constant	τ_e	ms	3.6	3.8	4.0	3.9	3.8
Mechanical Time Constant	τ_m	ms	1.6	1.5	1.4	1.4	1.5

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.

